DMITRIYEV, M.L., prof.

Use of auto-osteoblastic tissue in the surgical treatment of osteoblastoclastomas in children. Ortop., travm.i protez. (MIRA 15:3) no.2:15-18 '62.

1. Iz kafedry detskoy khirurgii i ortopedii (zav. - prof. M.L. Dmitriyev) Odesskogo meditsinskogo instituta im. N.I. Pirogova (rektor - zasl. deyatel' nauki UkrSSR prof. I.Ya. Deyneka).
(BONES—CANCER)

DMITRIYEV, M.L., prof.

Metallic osteosynthesis in fractures of the bones in children. (MIRA 15:5)
Nov.khir.arkh. no.4:38-40 '62.

1. Kafedra detskoy khirurgii i ortopedii (zav. - prof. M.L. Dmitriyev) Odesskogo meditsinskogo instituta.
(INTERNAL FIXATION IN FRACTURES)

DMITRIYEV, M.L., prof.; SUSHKOV, N.V.

Total transplantation of the epiphysial growth plate. Ortop., travm. i protez. no.8:30-34 '62. (MIRA 17:10)

1. Iz kafedry detskoy khirurgii i ortopedii (zav.- prof. M.L. Dmitriyev) Odesskogo meditsinskogo instituta imeni Pirogova (rektor - zasluzhennyy deyatel' nauki UkrSSR prof. I.Ya. Deyneka) i ortopedicheskogo otdeleniya (zav.- N.V. Sushkov) Odesskoy gorodskoy detskoy klinicheskoy bol'nitsy (galvnyy vrach- Ye.P. Makarenko).

SKRIPNICHENKO, D.F., prof., red.; SHURINOK, A.R., prof., red.; GABAY, A.V., prof., red.; DMITRIYEV, M.L., prof., red.; KHRISTICH, A.D., prof., red.; ZAYCHENKO, I.L., prof., red.; SITKOVSKIY, N.B., kand. med. nauk, red.; PARKHOMENKO, V.N., red.

[Problems in pediatric surgery; transactions] Problemy khirurgii detskogo vozrasta; trudy. Kiev, Gosmedizdat USSR, 1963. 257 p. (MIRA 17:5)

1. Ukrainskaya nauchno-prakticheskaya konferentsiya khirurgov detskogo vozrasta. 1st.

DMITRIYEV, M.L., prof.; PROKOPOVA, L.V., kand.med.nauk

Characteristics of the course of acute appendicitis in children with spinal fractures. Vest. khir. 93 no.12:88-90 D '64. (MIRA 18:5)

1. Iz kafedry khirurgii i ortopedii detskogo vozrasta (zav. - prof. M.L.Dmitriyev) Odesskogo meditsinskogo instituta imeni Pirogova (rektor - prof. I.Ya.Deyneka).

DMITRIYEV, M.L., prof. (Odessa, ul. Engel'sa, d.44, kv.5)

Use of autologous osteoblastic tissue in bone grafting. Ortop., travm. i protez. 26 no.2:67-68 F '65. (MIRA 18:5)

1. Iz kafedry khirurgii i ortopedii detskogo vozrasta (zav. - prof. M.L.Dmitriyev) Odesskogo meditsinskogo instituta imeni N.I.Pirogova (rektor - zasluzhennyy deyatel' nauki UkrSSR prof. I.Ya.Deyneka).

DMITRIYEV, M.L., prof.

Age-related characteristics in the treatment of fractures in children. Vest. khir. no.10:94-98 '64. (MIRA 19:1)

1. Iz kafedry khirurgii, ortopedii i travmatologii detskogo vozrasta (zav. - prof. M.L. Dmitriyev) Odesskogo meditsinskogo instituta imeni Pirogova (rektor - zasluzhennyy deyatel' nauki UkrSSR prof. I.Ya. Deyneka).

DMITRIYEV, M.M., inzh. po izobretatel'stvu

Proposals of efficiency promoters of the Yegoryevsk Melange Combine. Tekst.prom. 22 no.10:53-54 O '62. (MIRA 15:11)

1. Yegor'yevskiy melanzhevyy kombinat.
(Yegoryevsk--Textile machinery--Technological innovations)

DMITRIYEV, M.M., inzh.

Conference of specialists on the by-products coke industry of the Committee on Coal in the European Economic Commission of the United Nations. Met. i gornorud. prom. no.4:85-88 Jl-Ag '63. (MIRA 16:11)

DMITRIYEV, M. M., YEGOROV, N. N. and ZYKOV, D. D.

"Desulfurization of Coke Gas and Other Combustible Gases," Metallurgizdat, 1950

Commentary, preface, selected excerpts, etc. W-19722, 28 Sep 51

DMITRIYEV, M.M.

VODNEV, G.G.; SHELKOV, A.K.; DIDENKO, V.Ye.; FILIPPOV, B.S.; TSAREV, M.N.; ZASHVARA, V.G.; LITVINENKO, M.S.; MEDVEDEV, K.P.; MOLODTSOV, I.G.; LGALOV, K.I.; RUBIN, P.G.; SAPOZHNIKOV, L.M.; TYUTYUNNIKOV, G.N.; DMITRIYEV, M.M.; LEYTES, V.A.; LERNER, B.Z.; MEDVEDEV, S.M.; REVYAKIN, A.A.; TAYCHER, M.M.; TSOGLIN, M.E.; DVORIN, S.S.; RAK, A.I.; OBUKHOVSKIY, Ya.M.; KOTKIN, A.M.; ARONOV, S.G.; VOLOSHIN, A.I.; VIROZUB, Ye.V.; SHVARTS, S.A.; GINSBURG, Ya.Ye.; KOLYANDR, L.Ya.; BELETSKAYA, A.F.; KUSHNEREVICH, N.R.; BRODOVICH, A.I.; NOSALEVICH, I.M.; SHTROMBERG, B.I.; MIROSHNICHENKO, A.M.; KOPELIOVICH, V.M.; TOPORKOV, V.Ya.; AFONIN, K.B.; GOFTMAN, M.V.; SEMENENKO, D.P.; IVANOV, Ye.B.; PEYSAKHZON, I.B.; KULAKOV, N.K.; IZRAELIT, E.M.; KVASHA, A.S.; KAFTAN, S.I.; CHEREMNYKH, M.S.; SHAPIRO, A.I.; KHALABUZAR', G.S.; SEKT, P.Ye.; GABAY, L.I.; SMUL'SON, A.S.

Boris Iosifovich Kustov; obituary. Koks i khim. no.2:64 '55.(MLRA 9:3)
(Kustov, Boris Iosifovich, 1910-1955)

DIDENKO, V.Ye.; TSAREV, M.N.; DMITRIYEV, M.M.; LEYTES, V.A.; OBUKHOVSKIY, Ya.M.; IVANOV, Ye.B.; CHERTOK, V.T.; URSALENKO, B.N.; KRIGER, I.Ya.; PINCHUK, A.K.; ANTONENKO, N.Z.; SMUL'SON, A.S.; VASIL'CHENKO, S.I.; DRASHKO, A.M.; RAYEVSKIY, B.N.; KUCHIRYAVENKO, D.N.; SAVCHUK, A.I.; ZHURAVLEVA, L.I.; BAUTIN, I.G.; KHRIYENKO, V.Ya.; MOSENKO, N.K.; CHEBONENKO, G.P.; LISSOV, L.K.; MAMONTOV, V.V.; BELUKHA, A.A.; POYDUN, V.F.; VOLODARSKIY, M.B.; KAL'CHENKO, G.D.; LEVCHENKO, V.M.; BASHKIROV, A.A.; VOROB'YEV, M.F.; IL'CHENKO, L.I.; PODSHIVALOV, F.S.; MOGIL'NYY, P.P.; LEVI, A.R.; VASLYAYEV, G.P.; DURNEV, V.V.; OSYPA, S.S.; SAMOFALOV, G.N.; FOMIN, A.F.; LESHCHINA, A.I.; FANKEL'BERG, G.Ye.; KHODANKOV, A.T.; MAKARENKO, I.S.; KARPOVA, K.K.; VASILENKO, I.M.; VOLOSHCHUK, A.S.; SHELKOV, A.K.; FILIPPOV, B.S.; TYUTYUNNIKOV, G.N.; DOLINSKIY, M.Yu.; NIKITINA, P.P.; MEDVEDEV, S.M.; TSOGLIN, M.E.; LERNER, R.Z.; BOGACHEV, V.I.

Mihail IAkovlevich Moroz; obituary. Koks i khim.no.3:64 '56.(MLRA 9:8)
(Moroz, Mikhail IAkovlevich, 1902?-1956)

DMITRIYEV, M.M.

DIDENKO, V.Ye., red.; OBUKHOVSKIY, Ya.M., red.; LEYTES, V.A., red.; DMITRIYEV, M.M., red.; NAUMOV, V.I., red.izd-va; MIKHAYLOVA, V.V., tekhn.red.

[Improvement in technical control in the coal-tar chemical industry; a collection of articles] Sovershenstvovanie tekhnicheskogo kontrolia koksokhimicheskogo proizvodstva; sbornik statei. Moskva, Gos. nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1958. 360 p. (MIRA 11:5)

(Coal-tar industry)

DMITRIYEV, M.M

AUTHOR: Dimitriyev, M.M. SOV/68-58-10-20/25

TITLE: Conference of the Ukrainian Carbonisation Chemists (Na soveshchanii koksokhimikov Ukrainy)

PERIODICAL: Koks i Khimiya, 1958, Nr 10, p 58 (USSR)

ABSTRACT: The conference took place on July 3-4 in Dneprpetrovsk. V.Ye. Didenko read a paper: "Tasks of the Ukrainian Coking Industry in the Light of the Decisions of the May Plenum of the Central Committee of the Communist Party of the Soviet Union". After a lively discussion, during which some activities of UKhIN and Giprokoks were criticised, the following recommendations were made: 1) A considerable development in the range of coking products, including those produced in small quantities and a more complete utilisation of products present in coke-oven gas; 2) An increase in the volume of technical-economic research work; 3) An increase in the output of chemical raw materials by utilising Donets gas coals on special coke-gas chemical works; 4) Further construction of new distillation plants to treat all the raw benzol and tar produced at present; 5) Development of new chemical apparatus for the production of new coking products; 6) Organisation at GNTK of the Council of Ministers of the USSR of a permanent committee

Card1/2

Conference of the Ukrainian Carbonisation Chemists

for co-ordination of the development of production and consumption of chemical coking products and organisation of new forms of production; 7) Organisation of the exchange of experience by publications and regular conferences and 8) to call a conference of carbonisation and petroleum chemists as well as specialists on the chemical treatment of gases in the near future, in order to discuss and co-ordinate the work of supplying the chemical industry with raw materials for the production of plastics, synthetic materials and other products.

DMITRIYEV, Mikhail Mikhaylovich; OBUKHOVSKIY, Yakov Mironovich; OSTROVSKIY, A.L., red.; ZAYCHER, M.M., red.; ROZENTSVEYG, Ya.D., red.izd-va; KLEYNMAN, M.R., tekhn.red.

[Short manual for a coke chemist] Kratkii spravochnik koksokhimika. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1960. 252 p. (MIRA 13:2)
(Coke industry--Hanboooks, manuals, etc.)

DMITRIYEV, M. M.

PHASE I BOOK EXPLOITATION SOV/5329

Yegorov, Nikolay Nikolayevich, Mikhail Mikhaylovich Dmitriyev, Dmitriy Dmitriyevich Zykov, and Yuriy Nikolayevich Brodskiy

Ochistka ot sery koksoval'nogo i drugikh goryuchikh gazov (Purification of Coke Gas and Other Combustible Gases From Sulfur) 2d ed., rev. and suppl. Moscow, Metallurgizdat, 1960. 341 p. Errata slip inserted. 3,200 copies printed.

Ed. (Title page): N. N. Yegorov; Ed. of Publishing House: M. L. Yezdokova; Tech. Ed.: M. R. Kleynman.

PURPOSE: This book is intended for technical personnel of the by-product coke and gas industries, and may also be used by students specializing in the processing of fuels and combustible gases.

COVERAGE: The book reviews methods of removing hydrogen sulfide and organic sulfur compounds from combustible gases, with evaluations and comparisons of the more widely used and promising methods. For those techniques which are of practical value in

Card ~~1/10~~

Purification of Coke Gas (Cont.) SOV/5329

industry, computational data on processing, descriptions and computational data on equipment, and production figures are given. The necessary pre-desulfurization conditions for gases are characterized along with methods of utilizing the hydrogen sulfide from the purification cycle. The alkali-arsenous oxide ethanolamine methods of purification are discussed in detail. Yu. N. Brodskiy wrote chapter 13 and assisted in the revision of other chapters. There are 171 references: 82 Soviet, 62 English, 24 German, 2 Italian, and 1 French.

TABLE OF CONTENTS:

Foreword to the Second Edition

Foreword to the First Edition 3

Introduction 4

Ch. I Characteristics of Coke Gas and Other Gases 5
Coke gas 5
5

Card ~~2/10~~

DMITRIYEV, M.M.

"Intensifying the operation of benzene sections in by-product coking plants" by K.A.Belov, S.N.Lazorin. Reviewed by M.M.Dmitriev. Koks i khim. no.4:61-63 '60. (MIRA 13:6)
(Coke industry--By-products)
(Benzene)

DMITRIYEV, M.M.; LEYTES, V.A.

Utilization of coke-oven gas. Koks i khim. no.7:56-58 '60. (MIRA 13:7)

1. Gosplan USSR.
(Coke-oven gas--Congresses)

DMITRIYEV, M.M.

Terminology of the coke industry. Koks i khim. no.9:55-57 '60.
(MIRA 13:9)

1. Gosplan USSR.
(Coke industry--Terminology)

DMITRIYEV, M.M.

Hydrogen sulfide from coke-oven gas and its utilization. Zhur. VKHO 5 no.1:49-51 '60. (MIRA 14:4)
(Hydrogen sulfide) (Coke-oven gas)

BRON, Yakov Abramovich; SATANOVSKIY, Semen Yakovlevich; DMITRIYEV, M.M. otv. red.; LEYTES, V.A., otv. red.; BELINA, R.A., red. izd-va; ANDREYEV, S.P., tekhn. red.

[Tubular units for distilling coal tar] Trubchatye agregaty dlia peregonki kamennougol'noi smoly. Khar'kov, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1961. 230 p. (MIRA 14:11)

(Coal tar industry—Equipment and supplies)

DIDENKO, Viktor Yefimovich; DMITRIYEV, Mikhail Mikhaylovich; LEYTES, Viktor Abramovich; OBUKHOVSKIY, Yakov Mironovich; LIBERMAN, S.S., red. izd-va; ANDREYEV, S.P., tekhn. red.

[Organization of the coke industry] Organizatsiia koksokhimicheskogo proizvodstva. Khar'kov, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1961. 462 p. (MIRA 14:10)
(Coke industry)

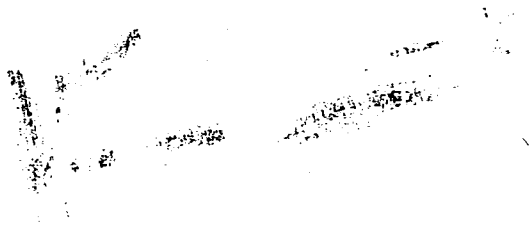
DMITRIYEV, M.M.

On M.S.Litvinenko's book "Removal of hydrogen sulfide from coke-oven gas (the vacuum-carbonate method)." Koks i khim. no. 3:63-64 '61. (MIRA 14:4)

1. Gosplan USSR.
(Coke-oven gas) (Hydrogen sulfide)
(Litvinenko, M.S.)

DMITRIYEV, M.M.

"Refining crude benzene" by L.IA. Koliandr. Reviewed by M.M. Dmitriev. Koks i khim. no.7:63-64 Jl '61. (MIRA 14:9)
(Benzene)
(Koliandr, L.IA.)



Dmitriyev, M.M.

PHASE I BOOK EXPLOITATION SOV/6098

Assonov, V. A., and L. A. Paporotskiy, Resp. Eds.

Novoye v sredstvakh i sposobakh vzryvaniya (New Developments in Blasting Means and Methods). Moscow, Gosgortekhizdat, 1962. 124 p. (Series: Vzryvnoye delo; Sbornik no. 48/5) Errata slip inserted. 3000 copies printed.

Sponsoring Agency: Nauchno-tekhnicheskoye gornoye obshchestvo.

Ed. of Publishing House: A. Ya. Koston'yan; Tech. Eds.: L. I. Minsker and G. M. Il'inskaya.

PURPOSE: The book is intended for mining engineers, workers in scientific research and planning organizations, and also for teachers and students of mining and technical schools.

COVERAGE: This collection of articles describes new blasting means and methods, means of protecting electric detonators from stray currents, and improved methods of short-delay detonation.

Card 1/6

New Developments in Blasting Means (Cont.) SOV/6098

TABLE OF CONTENTS:

Foreword 3

Paporotskiy, L. A. Modern Means and Methods of Detonation 5

The article mentions that experiments are being conducted on developing methods of electric detonation of explosive charges with the help of radiowaves and of direct ignition of an explosive charge by an electric discharge

Tarasenko, D. F., and M. M. Dmitriyev. New Means of Detonation and Ignition 10

The author briefly describes the following: ЭД-8П-59, ЭД-9-60, and ЭД-8С instant electric detonators; ЭДКЗ-35 short-delay electric detonator; ТЭД-230-$А_3$ heat-resistant electric detonator; ППТ-230 pyrocartridge;

Card 2/6

TARASENKO, D.F.; DMITRIYEV, M.M.

New means of blasting and detonation. Vzryv. delo no.48/5:10-19 '62. (MIRA 15:9)
(Detonators)

DMITRIYEV, M.M.

Let the resources of coke by-products work for "Big Chemistry."
Met. i gornorud. prom. no.1:6-8 Ja-F '64. (MIRA 17:10)

BUTUZOV, A.I.; FAYNZIL'BERG, S.N.; LEONT'YEV, G.G.; BALITSKIY, S.A.; DMITRIYEV, M.M.

Use of refrigeration in the coke and coal chemicals industry. Koks i khim. no.7:37-40 '65. (MIRA 18:8)

1. Kiyevskiy politekhnicheskiy institut (for Butuzov, Faynzil'berg, Leont'yev). 2. Donetskiy filial Nauchno-issledovatel'skogo i proyektnogo instituta metallurgicheskoy promyshlennosti (for Balitskiy). 3. Ukrainskiy sovet narodnogo khozyaystva (for Dmitriyev).

DMITRIYEV, M.M.

The coke by-products industry of the Ukraine in 1964.
Met. i gornorud. prom. no.3:48-49 My-Je '65.
(MIRA 18:11)

DMITRIYEV, M.P.; VERMENICHEV, S.A.; KOCHNEV, M.I.

Economic efficiency of smelting copper sulfide concentrates in an oxygen-enriched flame. Trudy Inst. met. UFAN SSSR no.8:51-59 '63. (MIRA 17:9)

DMITRIYEV, M.S.

Instrument for reproduction and measurement of time intervals in a wide band. Izm.tekh. no.2:38-41 Mr-Ap '58. (MIRA 11:3)
(Time measurements)
(Pulse techniques (Electronics))

17

AUTHORS: Dmitriyev, M.S. and Fisher, G.M., Lieutenant-Colonels of the Medical Corps
Klyuchnikova, A.G., Major of the Medical Corps
Sasina, V.G., Lieutenant-Colonel of the Medical Corps
Radzivilovskiy, S.L., Lieutenant-Colonel of the Veterinary Corps

SOV/177-58-4-14/32

TITLE: On Centers of Q Fever in the Central Volga Region (Ob ochagakh likhoradki Ku v Srednem Povolzh'ye)

PERIODICAL: Voyenno-meditsinskiy zhurnal, 1958, Nr 4, pp 43-45 (USSR)

ABSTRACT: The author reports on the first cases of Q fever in the Vol'sk-Shikhany District in the Central Volga Region. The acute disease sets in with a general malaise and intensive pain in the forehead and the area of the eye-sockets. The body aches all over, especially in the extremities. Pronounced asthenia, frequent chills, insomnia and lack of appetite are characteristic of

Card 1/2

On Centers of Q Fever in the Central Volga Region

Q fever. In many cases, treatment with the Burnet antigen was successful. In spite of many examinations of men and animals, the author was not able to reveal the source of infection. In the district of the Central Volga Region, Q fever is probably caused by aerogenous and alimentary infection.

ACC NR: AP7010723 SOURCE CODE: UR/0240/66/000/012/0077/0081

AUTHOR: Dmitriyev, M. T. (Candidate of technical sciences)

ORG: Institute of General and Communal Hygiene imeni A. N. Sysin, Academy of Medical Sciences USSR, Moscow (Institut obshchey i kommunal'noy gigiyeny AMN SSSR)

TITLE: Basis of ventilation standards for rooms with gamma ray sources

SOURCE: Gigiyena i sanitariya, no. 12, 1966, 77-81

TOPIC TAGS: ventilation engineering, gamma ray, nitric oxide, ozone

SUB CODE: 13,07

ABSTRACT: With a room volume of less than 50 m^3, ventilation standards according to the Soviet Sanitary Regulations, which call for a doubling of the ventilation standards when injurious substances are not distributed uniformly in the air, are satisfied by the maximum permissible concentrations of ozone and nitric oxide. When the room volume is over 50 m^3, the air flow rates calculated according to the Sanitary Regulations have to be increased by 20%; over 100 m^3, by 40%; over 150 m^3, by 50%; over 200 m^3, by 70%; over 250 m^3, by 80%; 300 to 400 m^3, by 90%; over 400 m^3, by 100%. For rooms with a volume of 1 to 200 m^3, the air flow rate (in m^3/sec) is $(244 / 1.1 V) 10^{-7}$ A. Orig. art. has: 1 figure, 10 formulas and 1 table.

Card 1/1 JPRS: 40,351 UDC: 613.161:621.039.58

DMITRIYEV, M.I.

4

CH

Kinetics of the nitrogen oxidation reaction by electron collision. S. Ya. Pshezhetskii and M. T. Dmitriev. Doklad. Akad. Nauk S.S.S.R. 103, 647-50(1955). The electron-collision method was used in the study of the N-oxidation reaction kinetics in an app. consisting of a semi-electrode electron tube. The electrons were emitted from a direct-heated cathode, and were deflected by a modulator into the orifice of the anode diaphragm. The electron-ray current was directed from the collector into an ionization chamber with electrodes for the positively and negatively charged particles. The app. was calibrated by the Ne-ion appearance potential. The vessel was immersed in liquid O or N to sep. the reaction products, and the reaction rate was calcd. from the pressure drop in the vessel. The oxidation reaction on the glowing cathode was negligible. The oxidation rate of N at different pressures of the component gases can be expressed by an equation for reactions of the 2nd order, $V = kP_N P_O$, and a linear relation was found between the reaction rate and the gas pressure. Between 0 and 1.6 ma. the reaction rate is directly proportional to the elec. current intensity. The reaction rates were measured between 10 and 400 e.v. of electron energy, and were proportional to the N-ion concn. W. M. Sternberg

1 pm

DMITRIYEV, M.T.

89-10-21/36

AUTHORS Pshezhetskiy S.Ya., Dmitriyev, M. T.

TITLE Nitrogen Fixation by Ionizing Radiation.
(Fiksatsiya azota pri deystvii ioniziruyushchikh izlucheniy-Russian)

PERIODICAL Atomnaya Energiya, 1957, Vol 3, Nr 10, pp 350-352 (U.S.S.R.)

ABSTRACT The rules applying in the case of the oxidation of nitrogen under the influence of electron collisions and γ-radiation were determined experimentally. A 2 KV electron valve, a 200 kV linear accelerator and a 1400 C Co-60 source were used as radiation source. The oxidation velocity in dependence on the radiation dose, on gas composition, on gas pressure and gas temperature were especially investigated and the relation : $V = K.P_{N_2}.P_{O_2}$ applies.
For an electron shock up to 100 eV the process:

$N_2 \longrightarrow N_2^+ + e(N_2^{+*} + e, N_2^{++} + 2e)$ is about 10 times as probable as the process:

$N_2 \longrightarrow N^+ + N + e(N^+ + N^* + e, N^{+*} + N^* + e)$

The most important reactions observed are:

$$N_2^+ + O_2 \longrightarrow NO^+ + NO$$
$$N_2^{+*} + O_2 \longrightarrow NO_2^+ + N$$
$$N + O_2 \longrightarrow NO + O$$
$$N + O_2 + M \longrightarrow NO_2 + M$$

Tabularly the reaction yields are given in molecules NO_2 per 100 eV

Card 1/2

Nitrogen Fixation by Ionizing Radiation. 89-16-21/36

for the various radiators at various values of pressure and temperatures.
There are 1 table and 4 Slavic references.

SUBMITTED May 2o,1957
AVAILABLE Library of Congress.
Card 2/2

DMITRIYEV, M. T., PSHEZHETSKIY, S. Ya.

"The Kinetics and Mechanism of the Oxidation of Nitrogen Under Electron Bombardment" p.26

Trudy Transactions of the First Conference on Radioaction Chemistry, Moscow, Izd-vo AN SSSR, 1958. 330pp.
Conference -25-30 March 1957. Moscow

(4)

AUTHOR: Dmitriyev, M. T. SOV/76-32-10-28/39

TITLE: The Radiation Oxidation of Nitrogen (Radiatsionnoye okisleniye azota)
III. Some Problems on the Reaction Mechanism, and a Comparison With Electric Discharge Data (III. Nekotoryye voprosy mekhanizma reaktsii i sopostavleniye s dannymi po elektrorazryadu)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 10, pp 2418-2423 (USSR)

ABSTRACT: First it had to be explained whether the reaction kinetics in the discharge corresponds to that in the radiation reaction, and secondly the role played by the ions was to be explained. The measurements were carried out in high-frequency and other discharge forms. The discharge energy was determined in the calorimeter. The nitrogen oxides were spectrophotometrically analyzed. The maximum amount of NO_2 is formed in electric discharges from a 1 : 1 nitrogen-oxygen mixture. This observation as well as the NO_2 yield as a function of the pressure measured at silent glow, arc, and high-frequency

Card 1/4

discharge correspond to an equation of the second order. T. V. Zabolotskiy (Ref 6) had indicated the validity of this equation for electrical charge. The velocity constant of the destruction reaction of NO_2 is about 50 times higher than that of the NO_2 formation and the reaction also takes place according to the second order. The reaction velocity is directly proportional to the amperage as well as to the intensity of the radiations (in irradiations). The increase in frequency of the electric discharge leads to an increase of the NO_2 yield. The yield of the electronic irradiation amounts to 6 mole NO_2 at 100 eV of absorbed energy. The life of activated nitrogen is given to be about 10^{-4} seconds. This is characteristic for a recombination of the atoms and a neutralization of the ions. N. I. Kobozev, S. S. Vasil'yev, and Ye. N. Yeremin (Ref 9), and T. V. Zabolotskiy (Ref 6) as well as others had already pointed to the effect of a high-frequency discharge. An acceleration of the nitrogen ions up to 10-20 V decreases the radiation oxidation as

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410520006-3"

observed by Potter (Ref 11). The reaction of atoms and ions of nitrogen is taken to be the basic process in the nitrogen oxidation in the electric discharge and electronic irradiation, with the excited particles (life a little longer than 10^{-8} - 10^{-7} seconds) playing a certain role. Papers and data by Varney (Varni) (Ref 13), Jackson and Schiff (Dzhekson and Shiff) (Ref 14), Lichten (Likhten) (Ref 15), V. N. Kondratjew (Kondrat'yev) (Ref 16), Frost and McDowell (Frost and Mak-Dauell) (Ref 17) are mentioned. Finally the author thanks Professor S. Ya. Pshezhetskiy. There are 3 figures, 1 table, and 19 references, 9 of which are Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physical Chemical Institute imeni L. Ya. Karpov)

SUBMITTED: May 23, 1957

The Radiation Oxidation of Nitrogen
III. Some Problems on the Reaction Mechanism, and a Comparison With Electric Discharge Data

SOV/76-32-10-28/39

Card 4/4

5(4)

AUTHORS: Pshezhetskiy, S. Ya., Dmitriyev, M. T. SOV/76-32-12-5/32

TITLE: The Relation Between the Energy Yield and the Kinetics of the Radiation-Chemical Reaction (Svyaz' mezhdu energeticheskim vykhodom i kinetikoy radiatsionno-khimicheskoy reaktsii)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 12, pp 2686 - 2689 (USSR)

ABSTRACT: The energy yield of a radiation-chemical reaction in relation to the time of exposure is a function of its kinetics. It depends on whether the reaction takes place at a constant or rising speed, whether the reaction products are removed from the irradiation area, and on whether counter-reactions occur. Formulae are given for the various principal types of kinetics and for the operating conditions. There are 4 figures, 1 table and 1 Soviet reference.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova, Moskva (Physico-Chemical Institute imeni L. Ya. Karpov, Moscow)

SUBMITTED: July 1, 1957

Card 1/1

DMITRIYEV, M. T., Candidate Chem Sci (diss) -- "The kinetics and mechanism of radiation oxidation of nitrogen". Moscow, 1959. 11 pp(State Committee of the Council of Ministers USSR on Chem, Sci Res Phys-Chem Inst im L. Ya. Karpov), 110 copies (KL, No 23, 1959, 161)

05470
SOV/120-59-3-41/46

AUTHOR: Dmitriyev, M. T.

TITLE: The Convection Pressure Gauge
(O konvektsionnom manometre)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 3, pp 148-149 (USSR)

ABSTRACT: This paper deals with a Pirani gauge used at pressures such that heat is lost mainly by convection (0.5 - 1000 mm Hg). Eq (1) gives the heat loss rate as a function of pressure P and of the heater and gas temperatures, T and T_o respectively. Eq (2) is the energy balance equation; Eq (3) is the calibration equation. The gauge is properly termed a convection gauge only if condition (4) is complied with. Fig 1 shows results for a gauge with a platinum spiral (for use in corrosive gases) used in dry air; the currents (in A) corresponding to the various curves are given in the caption. Tab 1 gives the temperatures and pressures (measured and calculated). There is 1 figure, 1 table and 4 references

Card 1/2

The Convection Pressure Gauge

3 of which are Soviet and 1 English.

ASSOCIATION: Nauchno-issledovatel'skiy fiziko-khimicheskiy institut (Institute of Physico-Chemical Research)

SUBMITTED: March 3, 1958

5(4)

AUTHORS: Dmitriyev, M. T., Pshezhetskiy, S. Ya. SOV/76-33-2-36/45

TITLE: The Radiation Oxidation of Nitrogen (Radiatsionnoye okisleniye azota). IV. Temperature Dependence and the Part Played by Ions in the Reaction Under the Action of Fast Electrons (IV. Temperaturnaya zavisimost' i rol' ionov v reaktsii pod deystviyem bystrykh elektronov)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 2, pp 463-470 (USSR)

ABSTRACT: From the experimental results given in references 1 and 2 the reaction mechanism of the nitrogen oxidation at reduced pressure (1 mm Hg) can be explained in terms of the chemical reactions of the nitrogen ions. In the present paper the temperature function of the rate of reaction was investigated at a higher pressure (1 atm) and under the action of fast electrons with an energy of 200 kev. By removing the ions concerned from the reaction zone with a special probe the concentration of the positive and negative ions was varied. Data are given concerning the role of ion recombination and ion neutralization as well as several kinetic functions.

The energy of the electron beam was determined in a calorimeter with distilled water, while the nitrogen oxides were analyzed spectrophotometrically. The schematic representation of the testing apparatus is given (Fig 1). The following observations were made: the steady concentration of NO_2 is about 6%. The amount of NO_2 produced is proportional to the time the gas remains in the reaction zone and inversely proportional to the velocity of the penetrating radiation (Fig 2). The equation expressing the reaction rate (RG) as a function of the time is of second order (Table 2). The (RG) of the oxide decomposition is at constant conditions of 1 atm and 40° C about 50 times larger than the (RG) of the oxide formation. At concentrations below 2.5% NO_2 the NO_2 produced is proportional to the intensity of the irradiation (Table 3). With an increase in temperature the amount of NO_2 increases, reaching a maximum at about 200°C (Table 4). The values obtained for the activation energy lie between 1.2 and 1.7 kcal/mole.

The Radiation Oxidation of Nitrogen. SOV/76-33-2-36/45
IV. Temperature Dependence and the Part Played by Ions in the Reaction Under the Action of Fast Electrons

The energy reaction yield at 1 atm and 15-20° for an air mixture is 1.3 - 1.5 molecules of NO_2 per 100 ev and increases with an increase in temperature to ca 200° to 3 - 3.5 molecules of NO_2 per 100 ev. The above mentioned experiments with special probes showed that the (RG) constant is proportional to the probability of the ionization of the nitrogen and that the conclusion of the previous paper is correct (Ref 2). The oxidation reaction is thus at the given conditions determined by the primary N_2 ionization and the secondary recombination processes of the ions. The coefficients of this temperature were determined as a function of the temperature. There are 3 figures, 5 tables, and 8 references, 6 of which are Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova, Moskva (Physical-Chemical Institute imeni L. Ya. Karpov, Moscow)

SUBMITTED: August 7, 1957

Card 3/3

5(4)
AUTHORS: Dmitriyev, M. T., Pshezhetskiy, S. Ya. SOV/20-127-2-37/70

TITLE: Sensitization of Chemical Radiation Reaction by Means of an Ionic Charge Exchange

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 2, pp 369-372 (USSR)

ABSTRACT: Unlike photochemical sensitization which is based on the transfer of excitation energy, in chemical radiation reactions sensitization may take place by charge exchange on the collision of ions with molecules. This charge exchange makes it both possible to attain an increase in the concentration of chemically active ions as well as a suppression of unwanted chemical radiation processes. Sensitization by ionic charge exchange was investigated on the reaction of radiation oxidation of nitrogen by oxygen. The N_2^+ ion concentration was to be increased by the charge exchange of radiation-produced noble gas ions on the N-molecules. He, Ne and Ar were used. As their ionization potential lies above that of N, the following process was to occur: $N_2 + X^+ \longrightarrow N_2^+ + X$ (X = noble gas). Irradiation occurred

Card 1/3

Sensitization of Chemical Radiation Reaction
by Means of an Ionic Charge Exchange

SOV/20-127-2-37/70

with Co^{60}, absorbed γ-radiation was measured on the basis of the dosimetric oxidation of Fe^{II}. Exposure time amounted to 70 - 150 h, temperature 15 - 30°C, intensity of radiation 10^{13} - 5.10^{14} ev/cm^2 sec. Investigation was extended to the zone of slight charge exchanges, in which there is still a linear dependence between the amount of oxidation products formed and adsorbed radiation energy (Fig 1), viz. no decomposition of reaction products occurs yet. Results are shown in figure 2. A part of the air was replaced by various amounts of inert gases. Despite sinking N- and O-contents, the reaction rate rises with rising content of inert gas. The effect of noble gases was investigated on the basis of the likelihood of an electron transition in nonelastic collision:
$\frac{a.\Delta E}{hv} \gg 1$ (a = constant of the magnitude of the gas kinetic collision radius, ΔE = variation of energy, h = Planck constant, v = relative velocity of colliding particles). Table 1 shows the computation results. For argon, the values agree with experimental data, for Ne and He the relative effect computed is inversely related to experimental data. The cause is assumed to

Card 2/3

Sensitization of Chemical Radiation Reaction
by Means of an Ionic Charge Exchange

SOV/20-127-2-37/70

be a deviation of the distribution of positive ions from the Maxwell distribution, or the production of excited nitrogen ions in the reaction with Ne^+. A total coefficient β was computed for the effect of the charge exchange (Table 2). The effective cross section of the charge exchange may become for Ar ~ 1. When diluting the N-O mixture with noble gas, β drops, which fact may be caused by a recombination process concurring with the charge exchange: $X^+ + O_2 \longrightarrow \overrightarrow{X} + \overrightarrow{O_2}$. With high noble gas concentration, there may also occur a neutralization of noble gas ions at the vessel wall. Figure 3 shows the dependence of the energy yield on the composition of the gas mixture and on pressure. There are 3 figures, 2 tables, and 3 Soviet references.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova
(Physico-chemical Institute imeni L. Ya. Karpov)

PRESENTED: March 5, 1959, by S. S. Medvedev, Academician

SUBMITTED: 28, 1959 (Abstracter's Note: no month given)

Card 3/3

80100
S/080/60/033/04/10/045

5.2400

AUTHORS: Dmitriyev, M.T., Saradzhev, L.V., Miniovich, M.A.

TITLE: The Energy Yield of Decomposition of Nitrogen Oxides Under the Action of Ionizing Radiation

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 4, pp 808 - 814

TEXT: Nitrogen oxides can be used as gas dosimeters for ionizing radiation. The radiation oxidation of nitrogen is important for the manufacture of nitric acid by means of atomic energy. Data on the energy yields of the decomposition reaction of nitrogen oxides under the action of electrons and γ-radiation depending on the pressure, the temperature and the irradiation dose are given in the article. As sources of ionizing radiation an electronic beam with an energy of up to 1 kev and radioactive cobalt-60 with an acitvity of 20,000 Curie were used. A pressure increase from 10 mm Hg to 1.5 atm increases the decomposition yield of NO by 4%, of N_2O by 9%, but decreases the yield of NO_2 by 38%. A temperature increase from 0 to 400°C increases the decomposition yield of N_2O 1.9 times and of NO_2 7 times, but decreases the yield of NO by 10%. An increase in the irradiation dose decreases the decomposition yields of all oxides. The degree of the resistance against ionizing radiation of the various nitrogen oxides is the opposite of

Card 1/2

80100
S/080/60/033/04/10/045

The Energy Yield of Decomposition of Nitrogen Oxides Under the Action of Ionizing Radiation

the degree of their resistance against high temperature. The stationary concentration of the product of radio-chemical reaction corresponds to the equilibrium between the rates of direct and reverse reactions. In the case of small irradiation doses the stationary concentration of NO_2 was 6%, at intense irradiation it reached 10% and the irradiation with fission particles produced 5 - 15%. The best dosimeter of nitrogen oxides at a constant temperature proved to be N_2O, because its energy yield almost does not depend on the irradiation dose , the ionization density and the type of irradiation. If the temperature of the irradiated system is not constant the best results are obtained with NO.
There are: 6 graphs, 2 tables and 13 references, 9 of which are Soviet and 4 English.

SUBMITTED: July 3, 1959

Card 2/2

5.4300
5.4500(B)

80230
S/076/60/034/04/30/042
B010/B009

AUTHORS: Dmitriyev, M. T., Pshezhetskiy, S. Ya. (Moscow)

TITLE: Radiation Oxidation of Nitrogen. V. The Kinetics of Nitrogen Oxidation Induced by γ-Rays and the Part Played by Ion Recombination Processes

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 4, pp. 880 - 887

TEXT: In earlier papers (Refs. 1,2) it has been observed that even at pressures below 1 atmosphere in the reaction kinetics of nitrogen oxidation induced by gamma radiation a considerable reduction of the constant of reaction rate is caused by the recombination processes of inversely charged ions. Since these processes depend to a great extent on pressure, the reaction kinetics was studied in the present paper within the range of pressure from 1 torr to 150 atmospheres at temperatures of from 15-25° and 150°. The gamma radiation of Co^{60} (1.4 and 20 kC) was used and the amount of energy absorbed was determined by means of the dosimetrical reaction of iron oxidation ($Fe^{2+} \rightarrow Fe^{3+}$). The measured values show that the amount of NO_2 obtained is proportional to the duration and intensity of

Card 1/2

Radiation Oxidation of Nitrogen. V. The Kinetics of Nitrogen Oxidation Induced by γ-Rays and the Part Played by Ion Recombination Processes

80230
S/076/60/034/04/30/042
B010/B009

irradiation. The ratio N_2O : NO_2 increases with increasing pressure. The N_2O yield is as little as 1/2 to 1/3 of the NO_2 yield. The pressure increase up to 1 atmosphere causes the energy yield to drop, at pressures above 1 atmosphere the yield increases to reach a value of 5-6 molecules of NO_2 per 100 ev at 150 atmospheres (Table 1). The dependence of the reaction rate upon the composition of the reaction mixture corresponds to an equation of the second order, while the dependence of both the reaction rate and energy yield on pressure deviates from this equation. This deviation is held to be due to the ion recombination. Tables 2 and 3 contain the values of the dependence of the recombination coefficient upon pressure. Data concerning the relation between the constant of the reaction rate and the coefficients of ion recombination are also given. The authors conclude by thanking Ye. I. Zolotarev, Ye. V. Bol'shun, Z. I. Vyazovikina, and F. M. Rappoport for their assistance with the measurements. There are 6 figures, 3 tables, and 11 references, 7 of which are Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova Moskva (Physicochemical Institute imeni L. Ya. Karpov, Moscow)

SUBMITTED: July 9, 1958

Card 2/2

21996
S/076/61/035/004/001/018
B106/B201

21.6100
11.1170

AUTHORS: Dmitriyev, M.T., and Saradzhev, L.V.

TITLE: Decomposition of oxides of nitrogen under the action of gamma radiation

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 4, 1961, 727 - 735

TEXT: One of the authors, assisted by S.Ya. Pshezhetskiy, had earlier made a thorough analysis of data available in the literature on the decomposition of oxides of nitrogen subjected to irradiation with alpha particles, fast electrons, and products of nuclear fission (Ref. 10: Uspekhi khimii, 26, 725, 1957). The kinetics of these processes, however, had not been included in that study. The present paper deals with the decomposition of oxides of nitrogen (NO, N_2O, NO_2) under the action of gamma radiation, as there are no data available in the literature on this problem. The radiation source was radioactive cobalt (activity about $2 \cdot 10^4$ curie; time of irradiation 95-110 hours; temperature 15-30° C). The irradiation intensity varied in different series of measurements be-

Card 1/9

Decomposition of oxides of ...

tween $5 \cdot 10^{13}$ and $5 \cdot 10^{14}$ ev/cm^{3}sec. The measurements included the determination of the yields of the decomposition products of oxides of nitrogen, as related to the radiation energy, the yields of every single reaction product, and the reaction rate as a function of irradiation intensity and pressure (in the range of 7 - 1200 mm Hg). The dosimetric measurements and the colorimetric determination of NO_2 were performed in the same way as in a previous work (Ref. 14: Zh. fiz. khimii, 34, 880, 1960). Results obtained: N_2O is decomposed under the action of gamma radiation at 1 atmosphere with a yield of 11.4 molecules per 100 ev. This yield is independent of the ionization density. The total yield of decomposition products is 14.9 molecules per 100 ev. The reaction products are formed in the ratio $[N_2] : [NO_2] : [O_2] = 1 : 0.48 : 0.14$. The most probable energetic yield of the decomposition of N_2O under the action of different radiations (alpha particles, fast electrons, irradiation in nuclear reactor, gamma radiation) is 11.6 molecules per 100 ev. In the case of NO the energetic yield is 14.8 molecules per 100 ev under gamma irradiation

Card 2/9

Decomposition of oxides of ...

at 1 atmosphere. This yield is to a slight degree dependent upon the ionization density. The total yield of decomposition products is 11.4 molecules per 100 ev, and the products are formed in the ratio $[NO_2]$: $[N_2]$: $[N_2O]$ = 1 : 0.53 : 0.06. The most probable energetic yield under the action of different radiations is 14.8 molecules per 100 ev under light irradiation, whereas it is less under irradiation with heavier particles (nuclear reactor). NO_2 under gamma irradiation at 1 atmosphere is decomposed with a yield of 2.1 molecules per 100 ev. The total yield of decomposition products is 2.9 molecules per 100 ev, and the products are formed in the ratio $[O_2]$: $[N_2O]$: $[N_2]$ = 1 : 0.33 : 0.25. The energetic yield of the decomposition products depends markedly upon the ionization density. The authors also studied the probable mechanism of the above-mentioned decomposition reactions under the action of gamma radiation. The principal part is played by excitation and decomposition of excited molecules. The secondary processes are mainly reactions of nitrogen and oxygen atoms with oxides of nitrogen. The apparent stability of pure ni-

Card 3/9

21996
S/076/61/035/004/001/018
B106/B201

Decomposition of oxides of ...

trogen dioxide against the action of ionizing radiations is based on reverse reactions taking place under the formation of NO_2, and, therefore, strongly reducing the energetic yield of decomposition. S. Ya. Pshezhetskiy is thanked for his evaluation of the present work, Ye. I. Zolotarev and Ye. B. Nechushkin for their assistance in the measurements, and M.A. Minievich for valuable advice. There are 5 figures, 4 tables, and 19 references: 9 Soviet-bloc and 10 non-Soviet-bloc. The three most recent references to English-language publications read as follows: P. Harteck, S. Dondes, Nucleonics, 14, no. 3, 66, 1956; P. Harteck, S. Dondes, J.Chem.Phys., 27, 547, 1958; P. Harteck, S. Dondes, J.Chem. Phys., 22, 953, 1954.

ASSOCIATION: Institut azotnoy promyshlennosti
(Institute of the Nitrogen Industry)

SUBMITTED: July 8, 1959

Card 4/9

21996
S/076/61/035/004/001/018
B106/B201

Decomposition of oxides of ...

Table 1: Energetic yield of nitrous oxide decomposition under different irradiations. (1) irradiation; (2) energetic yield of the decomposing N_2O molecule per 100 ev; (3) according to data; (4) alpha particles; (5) fast electrons; (6) nuclear reactor, gamma radiation; (7) authors' results

Таблица 1

Энергетический выход разложения закиси азота для различных излучений

(1) Излучение	(2) Энергетический выход: молекулы N_2O, распадающиеся на 100 eV	(3) По данным:
(4) α-частицы	5,5—8,1	[2]
	8,5—12,7	[3]
	10,6	[4]
(5) Быстрые электроны	12,4	[5]
(6) Ядерный реактор γ-излучение	12	[6]
	10,9—11,9	Авторов (7)

Card 5/9

Decomposition of oxides of ...

Таблица 2

Энергетический выход разложения окиси азота для различных излучений

(1) Излучение	(2) Энергетический выход: молекулы NO, распадающиеся на 100 ev	(3) По данным
(4) Быстрые электроны	15	[7]
(5) Ядерный реактор	9,5÷13,8	[8]
(6) γ-излучение	14,5÷15,1	Авторов

Table 2: Energetic yield of nitrous oxide decomposition under different irradiations. (1) irradiation; (2) energetic yield of decomposing NO molecules per 100 ev; (3) according to data; (4) fast electrons; (5) nuclear reactor; (6) gamma radiation

Card 6/9

21996
S/076/61/035/004/001/018
B106/B201

Decomposition of oxides of ...

Table 3:
Energetic yield of NO_2 decomposition as a function of the pressure. Molecules per 100 ev; temperature 19° C.
(1) pressure mm Hg;
(2) decomposition of NO_2;
(3) formation

Таблица 3

Энергетический выход разложения NO_2 в зависимости от давления, молекулы на 100 eV, температура 19°

(1) Давление, мм рт. ст.	(2) Распад NO_2	(3) Образование		
		N_2	O_2	N_2O
10	2,85	0,60	2,44	0,82
100	2,64	0,55	2,31	0,74
300	2,42	0,51	2,55	0,68
500	2,26	0,47	2,03	0,64
730	2,10	0,45	1,80	0,60
900	1,95	0,43	1,72	0,57
1000	1,84	0,41	1,65	0,55
1100	1,77	0,38	1,52	0,50

Card 7/9

Decomposition of oxides of ...

Таблица 4

Энергетический выход реакций, происходящих при радиационном окислении азота. Давление 1 *атм*, температура 15—20°

(1) Реакция	(2) Выход разложения, молекулы на 100 eV	(3) Энергетический выход образования продуктов, молекулы на 100 eV				
		N_2	O_2	N_2O	NO_2	(8) общий
(4) Окисление азота в смеси $N_2 + O_2$	—	—	—	0,62	1,41 *	2,03
(5) Разложение N_2O	11,4	9,2	1,3	—	4,4	14,9
(6) Разложение NO	14,8	3,8	—	0,4	7,2	11,4
(7) Разложение NO_2	2,1	0,45	1,8	0,6	—	2,9

Card 8/9

Decomposition of oxides of ...

Table 4: Energetic reaction yield in radiation oxidation of nitrogen; pressure 1 atmosphere; temperature 15-20° C.
(1) reaction; (2) decomposition yield. Molecules per 100 ev; (3) energetic yield of the formation of products. Molecules per 100 ev; (4) nitrogen oxidation in the $N_2 + O_2$ mixture; (5) N_2O decomposition; (6) NO decomposition; (7) NO_2 decomposition; (8) total

X

Card 9/9

5.4600
26.2312

24019
S/076/61/035/005/002/008
B101/B218

AUTHORS: Dmitriyev, M. T. and Pshezhetskiy, S. Ya. (Moscow)

TITLE: Radiation oxidation of nitrogen. VI. Sensitization of the oxidation of nitrogen by charge exchange between the nitrogen molecule and ions of inert gases

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 5, 1961, 1010-1018

TEXT: In previous papers (Ref. 1: Sb. "Deystviye ioniziruyushchikh izlucheniy na neorganicheskiye i organicheskiye sistemy (Effect of ionizing radiation on inorganic and organic systems), Izd-vo AN SSSR, M. 1958, p. 145; Ref. 2: Zh. fiz. khimii, 32, 2418, 1958) it was found that oxidation of nitrogen is caused by ionization of N_2 molecules and may be accelerated by increasing the concentration of N_2^+ ions. Such an increase in concentration can be brought about by transferring an electron from the N_2 molecule to positive inert-gas ions: $N_2 + X^+ \rightarrow N_2^+ + X$ (1). The authors studied the sensitization of radiation oxidation of N_2 by means

Card 1/8

of reaction 1. Some data have already been published (Ref. 3: Dokl. AN SSSR, 127, 369, 1959). The method is described in Refs. 1, 5, and 6 (Ref. 5: Zh. fiz. khimii 33, 463, 1959; Ref. 6: ibid., 34, 880, 1960). Two series of tests were performed: a) mixtures of N_2 and He were irradiated at 1-150 atm above a water surface; b) the oxidation rate of N_2 in $N_2 + O_2$ mixtures was studied as a function of the absorbed energy, of pressure, and of the composition of the mixtures, both in the presence of He at 0-150 atm, and in the presence of Ne and Ar at 1 atm. A linear relation between the formed NO_2 and the absorbed energy was found for mixtures of air and He, Ne or Ar. Fig. 2 represents the reaction rate as a function of pressure up to 1 atm; Fig. 4 shows the same as a function of composition if part of the mixture $N_2 + O_2$ is replaced by inert gases. If the latter had no effect, the reaction rate would follow the dashed lines. Table 2 gives some typical energy yields. Ionization and charge exchange in mixtures of N_2 + inert gas are given as: $N_2 \xrightarrow{k_1} N_2^+ + e$ (3);

Radiation oxidation of nitrogen...

$X \xrightarrow{k_2} X^+ + e$ (4); $X^+ + N_2 \xrightarrow{k_3} N_2^+ + X$ (5); $[X]^+ = (k_2/k_3)[X]/[N_2]$ (6); the formation rate of N_2^+ ions is given by: $d[N_2^+]/dt = k_1([N_2] + \beta[X])$ (7), where $\beta = k_2/k_1$. Table 3 shows values of β as calculated from Eq. (7). In the presence of O_2, also recombinations of ions: $X^+ + O_2^- \longrightarrow X + O_2$ (2) may occur. Besides, the following reactions may take place: $N_2^+ + O_2 \xrightarrow{k_4} N_2 + O_2^+$ (9); $O_2 + e \xrightarrow{k_5} O_2^-$ (10); $N_2^+ + O_2^- \xrightarrow{\alpha} N_2 + O_2$ (11); $X^+ + O_2^- \xrightarrow{k_6} X + O_2$ (12); $N_2^+ + O_2 \xrightarrow{k_7} NO^+ + NO$ (13). One obtains: $v = k_7([N_2] + \beta'[X])[O_2]$ (19), where $\beta' = (k_3/k_2)(k_1 + k_2[X]/[N_2])[N_2]/[X]$ (20). β' decreases with increasing concentration of the inert gas (Table 4), which is caused by the recombination process 2. It may also be seen from Table 4 that the recombination coefficient α is strongly reduced if the pressure rises. The sensitizing effect of the inert gases is due to the ratio He:Ne:Ar=1:1:16:1:40. The action of the inert gases is due to their charge transfer in collisions

Card 3/8

Radiation oxidation of nitrogen...

with the N_2 molecule. There are 6 figures, 6 tables, and 6 Soviet-bloc references.

ASSOCIATION: Institut im. Karpova, Moskva (Institute imeni Karpov, Moscow)

SUBMITTED: June 26, 1959

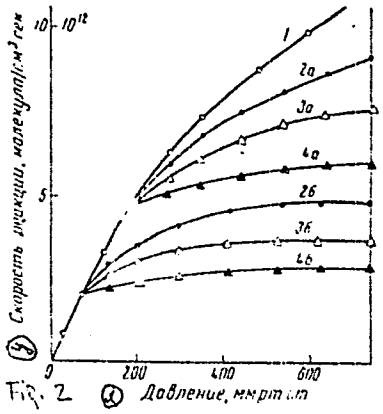


Fig. 2: Reaction rate as a function of pressure. Exposure 112 hr. Maximum intensity of irradiation $1.6 \cdot 10^{14}$ ev/cm^3. Temperature 21°C. Capacity of the ampoule 30 cm^3. Legend: a) initial air pressure 200 mm Hg; б) 70 mm Hg; 1) air; 2) argon; 3) neon; 4) helium; x) pressure, mm Hg; y) reaction rate, molecules/cm^3·sec.

Card 4/8

L 9011-65 EWT(d)/EWT(l)/EWT(m)/EEC(k)-2/ECC/EWA(d)/EEC-4/EWP(k)/EWA(h)/
EWP(r) Pf-4/Pg-4/Pk-4/Pl-4/Po-4/Pq-4 APTC(p) EM/GW
ACCESSION NR: AT4038811 S/2778/63/000/011/0049/0061

AUTHOR: Dmitriyev, M. T.

TITLE: Measurement of low atmospheric pressure with convection and ionization manometers

SOURCE: Leningrad. Nauchno-issledovatel'skiy institut gidrometeorologicheskogo priborostroyeniya. Trudy*, no. 11, 1963, 49-61

TOPIC TAGS: atmosphere pressure measurement, convection manometer, ionization manometer, radioactive manometer, meteorological instrument

ABSTRACT: Three new types of atmospheric pressure gages have been developed and tested in an attempt to determine their capabilities for measuring atmospheric pressure within the 10^{-7}—1100 mb range. The aneroid commonly used with the Soviet A-22 radiosonde has a threshold sensitivity of only 10 mb. These new pressure gages are: 1) a convection manometer which operates on the principle of convective heat exchange from a heating element fed with a known amount of energy and has a range of 10^{-3}—1100 mb; 2) an ionization manometer based on the principle that after an electric discharge, ion concentration is indicative of the

Card 1/2

L 9011-65

ACCESSION NR: AT4038811

pressure of the surrounding gas, and which, when combined with an ordinary cathode, has a range of 10^{-7}—0.15 mb; and 3) a radioactive manometer which measures gas ionization using a radioactive source which emanates alpha particles in place of a cathode and an accelerating electrode. This instrument registers pressures from 10^{-7} to 1100 mb. Another model of this manometer carries an ionization counter and uses cobalt 60 as the radiation source. In addition, new methods are being developed for the dosimetric determination of nuclear radiation. Orig. art. has: 5 tables, 5 figures, and 16 formulas.

ASSOCIATION: none

SUBMITTED: 00 ATD PRESS: 3105 ENCL: 00

SUB CODE: ES NO REF SOV: 003 OTHER: 000

Card 2/2

L 11935-63 EWT(m)/BDS AFFTC/ASD DM

ACCESSION NR: AP3003976 S/0089/63/015/001/0052/0059

AUTHOR: Dmitriyev, M. T.

52

TITLE: Domismetry of ionizing radiations by nitrogen reactions

SOURCE: Atomnaya energiya, v. 15, no. 1, 1963, 52-59

TOPIC TAGS: irradiation dosimetry, nitrogen, ionizing irradiation, neutron irradiation

ABSTRACT: Nitrogen reactions which take place on irradiation of air, nitrogen-oxygen mixtures, nitrogen oxides, water with dissolved air, and on neutron capture by nitrogen nuclei, are considered for application to dosimetry of ionizing radiations and of neutrons. On the basis of investigation of radiation-chemical effects, frozen-oxygen and nitrogen-oxide dosimeters are suggested for ionizing radiations and thermal neutrons. The lower limit for a measurable irradiation dose is 1 rad. for the total neutron flux 10^9 neutron per cm^2. These limits can be lowered by suitable methods. The method permits making measurements in natural conditions, using air and water. Orig. art. has: 3 figures, 3 tables, and 8 equations.

ASSOCIATION: none

SUBMITTED: 30Oct61 DATE ACQ: 08Aug63 ENCL: 00

SUB CODE: PH NO REF SOV: 011 OTHER: 003

Card 1/1

L 12673-63

ACCESSION NR: AP3000641 B/0080/63/036/003/0512/0522

EWP(q)/EWT(m)/BDS AFFTC/ASD JD

AUTHOR: Dmitriyev, M. T.

TITLE: Formation of nitric oxides and radioactive carbon during the irradiation of a nitrogen-oxygen system with nuclear radiation

SOURCE: Zhurnal prikladnoy khimii, v. 36, no. 3, 1963, 512-522

TOPIC TAGS: formation of nitric oxides, irradiation of nitrogen-oxygen mixture, radioactive carbon

ABSTRACT: This study is a continuation of earlier studies using electron and Gamma irradiation and electrical discharges. It presents the data for the formation of nitrogen oxides by irradiation of a nitrogen-oxygen mixture in a nuclear reactor with a neutron current of 10 sup 12 to 10 sup 13 neutrons per square cm per sec. It was shown that the dependence of the rate of formation of NO sub 2 on the intensity of irradiation, pressure, and temperature is similar to that obtained by Gamma- and electron-irradiation. The dependence of the reaction rate for NO sub 2 formation upon the composition of the mixture differs from that observed with Gamma and electron irradiation. The maximum reaction rate in a nuclear reactor corresponds to a nitrogen-oxygen ratio of approximately 3:2, as compared to the 1:1 ratio observed with other types of irradiation. This difference is explained by the formation

Card 1/2

L 12673-63
ACCESSION NR: AP3000641

5

of radioactive carbon through proton irradiation during a nuclear reaction. The energy yield in the nuclear reactor for air at 1 atm. and about 30C is 1.55 moles NO sub 2, at 0.135 atm. the yield is 2.6 moles, and, at 3.3 atm. the yield is 1.2 moles NO sub 2 per 100 ev. The relative yield of radioactive carbon depends upon the composition of mixtures, neutron flow, pressure, temperature, and intensity of irradiation. At 20C and 1 atm. of air pressure, the ratio [C sup 14] = [NO sub 2] = 2.1 x 10 sup minus 30/0. The relationship between neutron flow, intensity of irradiation, rate of NO sub 2 formation, and the relative yield of radioactive carbon is presented. "The author expresses especially deep acknowledgement to N. B. Makarov for his interest in the study and for valuable advice and thanks V. S. Pantuyev, I. N. Lep, L. V. Fatova, S. A. Lyubimtsev and S. I. Tharkov for their assistance in this work." Original art. has: 4 tables, 8 graphs.

ASSOCIATION: none

SUBMITTED: 30Oct61 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: CH NO REF SOV: 010 OTHER: 002

Card 2/2

L 12643-63 EPF(c)/EWP(q)/EWT(m)/BDS- AFFTC/ASD Pr-4 JD

ACCESSION NR: AP3002704 S/0080/63/036/005/1123/1134

64
58

AUTHOR: Dmitriyev, M. T.

TITLE: Formation of fixed nitrogen compounds in dissolved gas-containing water under the action of ionizing radiation

SOURCE: Zhurnal prikladnoy khimii, v. 36, no. 5. 1963, 1123-1134

TOPIC TAGS: ionizing radiation, nitrogen, nitrate, nitrite, ammonia, nitric acid

ABSTRACT: The effectiveness of the process of fixing nitrogen dissolved in water was investigated. Under influence of ionizing radiation, N can be combined to form nitrate, nitrite and ammonia, product yield depending on dissolved gas content, temperature and amount of energy absorbed. N or air at 1 atm. pressure forms 0.15 or 0.20 atoms of fixed N; at 100-150 atm., 1 or 1.5 atoms of fixed N are formed for 100 ev of absorbed energy. The NH_3 and nitrite formed by irradiation are further oxidized to nitrate; thus concentrated nitric acid solutions can be produced by prolonged irradiation. Kinetics of the N-fixing reaction are reported as a first order equation, based on N. The N compounds are formed by reaction of the dissolved nitrogen molecules, atoms of hydrogen and hydroxyl radicals formed by water radiolysis in the presence of additional excited molecules.

Card 1/2

L 12643-63
ACCESSION NR: AP3002704

6

"The author heartily thanks N. A. Bagrov for interest in the investigation and L. A. Vasil'yev, Ye. I. Zolotoy, Z. I Vyazovikin, S. A. Lyubimtsev and L. I. Aksenov for help in the work." Orig. art. has: 4 tables, 6 figures, 44 formulas.

ASSOCIATION: none

SUBMITTED: 30Nov61 DATE ACQ: 24Jul63 ENCL: 00

SUB CODE: CH NO REF SOV: 010 OTHER: 008

Card 2/2

DMITRIYEV, M.T.

Dosimetry of nuclear radiation and neutrons under natural conditions according to radiation effects and the study of radiation-induced chemical processes in the air. Trudy NIIGMP no.11:34-48 '63. (MIRA 18:1)

Measuring low air pressures with convection and ionization manometers. Ibid.849-61

Photocolorimetric determination of hydrazine in an aqueous solution. Ibid.862-66

ACCESSION NR: AP4020342 S/0089/64/016/003/0282/0283

AUTHOR: Dmitriyev, M. T.

TITLE: Ionizing radiation doses affecting the composition of the atmosphere of radiation laboratories

SOURCE: Atomnaya energiya, v. 16, no. 3, 1964, 282-283

TOPIC TAGS: capacity, ventilation device, radiation dose, ionizing radiation dose, radiation laboratory, maximum concentration, ozone, nitrogen dioxide

ABSTRACT: Highly toxic ozones and nitrogen oxides as well as other less important components are decreased and appear in smaller quanitites under the influence of ionizing radiation of a concentration of hydrogen and nitrogen in air. It was of interest to estimate the danger of the presence of these contaminants for personnel. The maximum permissible values of irradiation doses and integral neutron flux, corresponding to maximum permissible concentration of ozone and nitrogen dioxide in air can be taken on the basis of the capacity ratings for ventilation equipment. The capacity

Card 1/2

ACCESSION NR: AP4020342

of a ventilation device is determined by the equation N = 27.8 X 10-5 Gv where v is the volume of the room in m^3; N is the power of the ventilation device in m^3/sec. Consequently, in order that it might be possible to enter a room, for example with a volume of 100 m^3 after irradiation wherein the average capacity of irradiation dose was 0.1 r./sec. at 20C temperature, ventilation with capacity of N = 1 l/sec. is required. This ventilation can be provided by natural means. Thus, additional ventilation is needed for only very powerful radiations which create average irradiation dose rates exceeding 0.1 r/sec. Orig. art. has: 12 equations, 1 table.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: CH, PH NR REF SOV: 005 OTHER: 000

Card 2/2

ACCESSION NR: AP4032493 S/0080/64/037/004/0727/0734

AUTHOR: Dmitriyev, M. T.; Sorokin, Yu. A.

TITLE: Radiation-chemical formation of nitric oxide in the nitrogen-oxygen system at high temperatures.

SOURCE: Zhurnal prikladnoy khimii, v. 37, no. 4, 1964, 727-734

TOPIC TAGS: nitric oxide, preparation, radiation chemical synthesis, nitrogen oxygen system, nitrogen oxidation, energy yield, ion recombination coefficient, nitrogen oxide decomposition, thermal oxidation

ABSTRACT: The radiation-chemical formation of nitric oxide in the N_2-O_2 system was investigated from 0-1000C, at pressures of 0-150 atmospheres, reacting from 1-100 hours with radiation doses of 10^{12}-10^{19} ev/cm^3, using cobalt-60 of 20 kilocuries and a 200 kev electron accelerator. On increasing the temperature from 0-200C, the rate and energy yield of the reaction increase due to the decrease in the coefficient of the recombination of the ions. The effective energy of activation in the reaction of forming NO from N_2 and O_2 at 0-200C decreases with pressure, from 1.5 kcal/mol at 1 atm. to 0.2 kcal/mol at 150 atm. This is also caused by a

Card 1/2

ACCESSION NR: AP4032493

change in the conditions of ion recombination. At 200C the rate of radiation-chemical formation of NO is retarded due to the reverse reaction and consequent formation of NO_2 by oxidation of the NO. This reverse decomposition reaction also suppresses NO formation under established equilibrium conditions at low temperatures or when nitrogen oxides are added to N_2-O_2 system. On increasing the temperature from 200-700C the energy yield of NO decreases from 3.3 at 200C to 1.1 molecules/100ev at 600C due to the thermal decomposition of NO_2. At 700-1000C the radiation chemical rate of NO formation increases due to the supplemental thermal oxidation of nitrogen. Orig. art. has: 6 figures, 19 equations and 3 tables.

ASSOCIATION: None

SUBMITTED: 29Jan62

ENCL: 00

SUB CODE: IC, NP

NO REF SOV: 007

OTHER: 002

Card 2/2

L 26092-65 EWT(l)/EWG(k)/EPA(sp)-2/EWG(v)/FCC/EPA(w)-2/EEC(t)/T/EWA(m)-2
Pz-6/Po-4/Pab-10/Pe-5/Pae-2/Pi-4 IJP(c) AT/GW

ACCESSION NR: AT5001385 S/2778/64/000/012/0140/0151

AUTHOR: Dmitriyev, M.T.

TITLE: The competing processes method for measuring the recombination coefficient of ions in gases

SOURCE: Leningrad. Nauchno-issledovatel'skiy institut gidrometeorologicheskogo priborostroyeniya. Trudy, no. 12, 1964. Voprosy gidrometeorologicheskogo priborostroyeniya (Problems of hydrometeorological instrument manufacture), 140-151

TOPIC TAGS: atmospheric electricity, ion, ion recombination, meteorological instrument, light ion

ABSTRACT: Certain problems of atmospheric electricity associated with the neutralization of light ions in the air are considered and a new method for measurement of the recombination coefficient of ions in gases is described. Ions and electrons are neutralized in processes of recombination of ions and electrons:

$$x^+ + x^- \rightarrow 2x, \quad (1)$$
$$y^+ + y^- \rightarrow 2y, \quad (2)$$
$$x^+ + y^- \rightarrow x + y, \quad (3)$$
$$x^+ + e \rightarrow x + h\nu_1, \quad (4)$$
$$y^+ + e \rightarrow y + h\nu_2, \quad (5)$$

Card 1/5

Direct measurement of the recombination coefficient is possible only if the volume in which the ionization occurs is known. However, the recombination coefficient can be estimated by a basically new method. The mutual neutralization of charged particles described by equations 1-5 is almost always accompanied by elementary events with the participation of ions, competing with their recombination, such as dissociation, charge exchange and reaction:

$$x^+ + y^- \rightarrow x_1 + x_2 + y, \quad (6)$$

$$x^+ + y \rightarrow x + y^+, \quad (7)$$

$$x^+ + y \rightarrow xy^+, \quad (8)$$

$$x^+ + y^- \rightarrow xy + h\nu_3, \quad (9)$$

where ν_3 is the radiation frequency due to the excess energy associated with the formation of a molecule. The effectiveness of processes 6-9 is usually considerably less than the effectiveness of the neutralization processes 1-5. In addition, the ions forming in processes 6-9 also participate in recombination similar to 1-5. As a result, processes 6-9 do not lead to an appreciable change in the effectiveness of the processes of ion recombination or the value of the coefficient α. However, the effectiveness of the competing processes is related directly to the rate of ion recombination and the value α.

L 26092-65

ACCESSION NR: AT5001385

The competing process result in formation of qualitatively new particles which can be detected easily and measured quantitatively. As demonstrated in this paper in detail it is therefore possible to determine the coefficient of volume recombination of ions by a study of the competing processes. Fig. 1 of the Enclosure is a schematic diagram of an experimental apparatus for measurement of the coefficient α, described in additional detail in the text. The author first describes the application of the competing processes method to measuring the ion recombination coefficient for pressures of 1-150 atmospheres and temperatures of 0-200C. It is shown that the use of this method jointly with electrical measurements makes it possible to identify nuclear radiations. Orig. art. has: 30 formulas, 3 figures and 4 tables.

ASSOCIATION: Nauchno-issledovatel'skiy institut gidrometeorologicheskogo priborostroyeniya, Leningrad (Hydrometeorological instrument making scientific research institute)

SUBMITTED: 00 ENCL: 02 SUB CODE: ES, NP

NO REF SOV: 012 OTHER: 009

Card 3/5

L 26092-65
ACCESSION NR: AT5001385

ENCLOSURE: 02

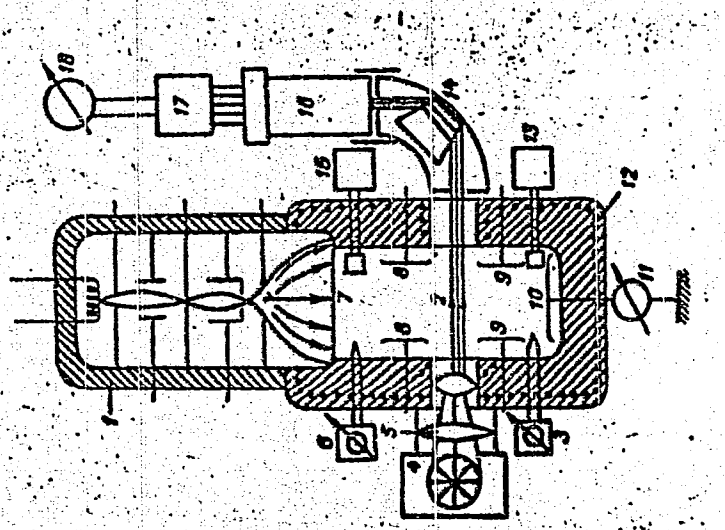
Fig. 1. Apparatus for measurement of coefficient α: 1. electronic accelerator; 2. flask with gas; 3 and 6. automatic pyrometers with thermocouples; 4. motion picture lamp in housing; 5. collimating lens; 7. aluminum foil; 8 and 9. plates for measurement of ion charge and concentration; 10. DC collector; 11. micro-ammeter for measuring electrical current; 12. electric heater; 13 and 15. convection manometers; 14. monochromator; 16. photomultiplier; 17. rectifier and voltage divider; 18. galvanometer.

Card 4/5

L 26092-65

ACCESSION NR: AT5001385

ENCLOSURE: 01



Card 5/5

DMITRIYEV, M.T.

Electric methods of measuring atmospheric pressure and radioactive-ionization manometers. Trudy NIIGMP no.14:28-59 '65.

Problems of the theory and methodology of the gammascopic method of measuring soil moisture. Ibid.:116-132 (MIRA 18:9)

DMITRIYEV, M.T.

Method of competitive processes in measuring the coefficient of the recombination of gas ions. Trudy NIIGMP no.12:140-151 '64.

Operating with an electronic model of the atmosphere in the process of ozone formation. Ibid.:152-160

Use of the energy of fission of heavy nuclei for the irradiation of the ari with ionizing radiations. Ibid.:161-164

(MIRA 18:4)

L 48591-65 EWG(j)/EWT(l)/EWT(m)/EPF(c)/EPR/EWP(t)/FCC/ENP(b)/ENA(h) Pc-4/
Pq-4/Pr-4/Ps-4/Pa-5/Pt-7/Pab/Pi-4 DIAAP/TJP(c) JD/GM

ACCESSION NR: AP5010227 UR/0362/65/001/003/0302/0312

AUTHOR: Dmitriyev, M. T.

TITLE: Some physicochemical processes in the air caused by ionizing radiation

SOURCE: AN SSSR. Izvestiya. Fizika atmosfery i okeana, v. 1, no. 3, 1965, 302-312

TOPIC TAGS: recombination, dissociation, ionization, radiation, stratosphere, nitrogen oxide, ozone, carbon dioxide

ABSTRACT: Physicochemical processes in the air--ionization, molecular dissociation, generation of ozone, nitrogen oxides, and carbon dioxide--caused by ionizing radiation were investigated. The energies of ionization and dissociation are given for the common products in the air and the probabilities of each are discussed. Recombination rates are also considered, and the dependence of recombination on temperature and pressure is analyzed. The mechanism of recombination depends on the air density. At pressures below 0.1 mm Hg dissociative recombination with an electron becomes dominant. The rate of radiative recombination of ions with electrons accompanied by radiation of photons is considerably less. Coefficients of recombination are given for different levels (pressures). The excited particles, ions, and atoms that form during radiation

Card 1/2

L 48591-65

ACCESSION NR: AP5010227

unite with molecules of nitrogen and oxygen to form NO, N_2O, NO_2, and O_3. The reaction rates for each of these are discussed and represented graphically. A definite relation was established between ionization of N and the reaction rate of NO_2. Similar relations were found for all combinations. It is pointed out that ionising and nuclear radiation leads to the formation of products having the strongest absorption band in the spectral range in which the intensity of solar radiation is high. Such radiation may thus lead to some stable warming of the stratosphere. Orig. art. has: 3 figures, 4 tables, and 27 formulas.

ASSOCIATION: Nauchno-issledovatel'skiy institut gidrometeorologicheskogo priborostroyeniya (Scientific Research Institute of Hydrometeorological Instrument Manufacture)

SUBMITTED: 09Nov64 ENCL: 00 SUB CODE: ES, NP

NO REF SOV: 016 OTHER: 001

Card 2/2

DMITRIYEV, M.T., kand.khim.nauk (Moskva)

Forecasting thundershowers. Priroda 54 no.7:65-66 Jl '65.
(MIRA 18:7)

DMITRIYEV, M.T.

Some physicochemical processes in the air caused by ionizing radiation. Izv. AN SSSR. Fiz. atm. i okeana 1 no.3:302-312 Mr '65. (MIRA 18:5)

1. Nauchno-issledovatel'skiy institut gidrometerologicheskogo priborostroyeniya.

DMITRIYEV, M.T.

Use of radioactive isotopes in meteorology. Atom. energ. 19 no.1: 97-98 Jl '65. (MIRA 18:7)

L 29001-66 EWT(m)

ACC NR: AP6018872 SOURCE CODE: UR/0240/65/000/004/0039/0044

63
B

AUTHOR: Dmitriyev, M. T. (Candidate of chemical sciences)

ORG: Scientific Research Institute of Hydrometeorological Instrument Building, Moscow (Nauchno-issledovatel'skiy institut gidrometeorologicheskogo preborostroyeniya)

TITLE: Effect of ionizing radiation on the composition of the air in production areas 19

SOURCE: Gigiyena i sanitariya, no. 4, 1965, 39-44

TOPIC TAGS: ionizing radiation, gamma radiation, nitrogen oxide, ozone, cobalt, radioisotope

ABSTRACT: Measurements were made in order to determine accurately the energy output of NO_2, N_2O and O_3 in the air at atmospheric pressure and 20°C as a result of gamma-radiation of Co^{60} and electrons with an energy of 8.2 MEV. The formation of NO_2, N_2O and O_3 as a function of temperature was also calculated. Neglecting the formation of N_2O, the maximum permissible integral neutron current for O_3 and NO_2 was found to be 10^{12} neutrons per square centimeter, and the maximum absorbed dose was found to be 1,000 r. On this basis the necessary ventilation can be calculated. Orig. art. has: 1 figure, 30 formulas, and 2 tables. [JPRS]

SUB CODE: 18, 07, 20 / SUBM DATE: 05Oct63 / ORIG REF: 003

Card 1/1 BLG UDC: 613.648:613.155

L 40273-66 EWT(l)/EWT(m)/FCC/EWP(t)/ETI IJP(c) JD/GW/GG

ACC NR: AR6014551 SOURCE CODE: UR/0169/65/000/011/A014/A014

58
B

AUTHOR: Dmitriyev, M. T.

TITLE: Physicochemical processes which lead to the formation and decomposition of nitrogen oxides in the air under the influence of nuclear and ionizing radiation 19

SOURCE: Ref. zh. Geofizika, Abs. 11A77

REF SOURCE: Tr. N.-i. in-ta gidrometeorol. priborostr., vyp. 13, 1965, 80-98

TOPIC TAGS: upper atmosphere, atmospheric ionization, nitric oxide, nitrogen oxide, upper atmospheric radiation, atmospheric radioactivity

ABSTRACT: The physicochemical processes which lead to the formation and decomposition of nitrogen oxides under the influence of ionizing radiation which occurs under natural conditions in the upper layers of the atmosphere in the presence of a number of atmospheric phenomena, ionization of the air, and the action of radioactivity, are investigated. It is shown that the formation of nitric oxide and nitrogen peroxide in the air is due to nitrogen ionization, the formation of nitrous oxide is due to oxygen dissociation, and the decomposition of the oxides of nitrogen is caused by processes of electron excitation. Author's abstract [Translation of abstract]

SUB CODE: 04

Card 1/1 UDC: 551.510.535:541.14

L 45883-66 EWP(j)/EWT(1)/EWT(m)/T/EWP(t)/ETI IJP(c) AT/RM/WW/JD

ACC NR: AP6026148 SOURCE CODE: UR/0076/66/040/007/1511/1515

69
68
13

AUTHOR: Dmitriyev, M. T.

ORG: Moscow Hydrometeorological Instrumentation Institute (Moskovskiy gidrometeorologicheskiy priborostroitel'nyy institut)

TITLE: Role of recombination electrons and ions in the radiation oxidation of nitrogen

SOURCE: Zhurnal fizicheskoy khimii, v. 40, no. 7, 1966, 1511-1515

TOPIC TAGS: radiation effect, nitrogen, ion recombination, electron recombination, oxidation rate

ABSTRACT: In order to elucidate the role of the recombination of ions in the radiation oxidation of nitrogen, the sticking probabilities and recombination coefficients determining the rates of the following processes were found:

$$N_2^+ + U^- \rightarrow N_2 + U,$$
$$N_2^+ + e \rightarrow 2N \text{ (where U is a negatively charged ion)}$$
$$O_2 + e \rightarrow O_2^-$$
$$N_2^+ + e \rightarrow N_2 + h$$

At irradiation dose rates (from Sr^{90}) of less than 10 Mr/sec, the concentration of

Card 1/2 UDC: 541.15

L 45883-66
ACC NR: AP6026148

negative ions in the nitrogen-oxygen system at atmospheric pressure substantially exceeds the free electron concentration. As the pressure increases in the range of 1-150 atm, this ratio increases. The sticking probability in oxygen amounts to 0.7×10^{-14} cm^3/sec, and the recombination coefficient in the nitrogen-oxygen system is 0.06-1.6 cm^3/sec, depending upon the pressure. At pressures of 1-150 atm in the nitrogen-oxygen system, the recombination of oppositely charged ions plays a negative part in the radiation oxidation of nitrogen by decreasing the energy yield of the reaction. Orig. art. has: 2 figures, 2 tables, and 21 formulas.

SUB CODE: 07/ SUBM DATE: 06Jan65/ ORIG REF: 001/ OTH REF: 001

Card 2/2